

*The New Mexico Academy of Science
2006 Annual Conference presents*

KNME-TV - NMA "SCIENCE CAFÉ"

*Sponsored by Sandia National Labs and NM Tech
Co-sponsored and Hosted by the New Mexico Museum of
Natural History and Science*

Celebrate the 300-year anniversary of Benjamin Franklin's birth
with KNME and the New Mexico Academy of Science.
Listen to one of only thirteen "armonica" musicians in the world
(playing an instrument invented by Benjamin Franklin)

Mayling García
**performing on the
Glass Armonica**

Followed by a discussion about the science of sound
by Dave Thomas and M. Kim Johnson,
Acoustic Scientists, Quasar International

Saturday, December 2, 2006
Two Performances: 10 a.m. to noon and 1:30 to 3:30pm
at the NM Museum of Natural History and Science

IMPORTANT: This Science Cafe is FREE, but reservations ARE required.
Seating is limited, but seats are being held for NMA members.
IF YOU WISH TO ATTEND, you MUST
contact Chris Sanchez at 841-2872 or chris.sanchez@state.nm.us
and tell him that you are a member of the NM Academy of Science

THEN...please join us during the evening of December 2nd for the...
NMA 2006 Annual Banquet,
Outstanding Science Teacher Awards
and Distinguished Lecture

We are honored to have as our *Distinguished Lecturer,*
Richard Sonnenfeld, Ph.D.
NM Tech and Langmuir Laboratory for Atmospheric Research

Dr. Sonnenfeld will present:
*"Ben Franklin in the 21st Century: What we know about lightning today,
and how we know it"*

Dinner will be at 6pm with the NM Outstanding Science Teacher awards following.
Dr. Sonnenfeld's invited lecture will be at 7:30pm.

*The evening will be held at the New Mexico Museum of Natural History and Science.
See page 5 in this newsletter for more information and page 8 for the banquet registration.*



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Recent gifts to the NMAAS.....

In the category "Under \$100"

Marjorie B. Bollschweiler
Dr. Stirling Colgate
Harry and Mona Pomeroy

(Gifts to the NMAAS Endowment,
See page 6)

**Don't Forget....
See page 5 of this newsletter
for more information on
the Academy's**

**2006 Annual Banquet,
Awards and
Distinguished Lecture**

**See page 8 of this newsletter
to reserve your space for
the banquet/lecture.**

*"People who are wrapped up in
themselves make small packages"*

Benjamin Franklin

NMAAS Newsletter
Volume 92, no. 3
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NEW MEXICO ACADEMY OF SCIENCE

Founded in 1902 to foster scientific research and scientific cooperation, increase public awareness of the role of science in human progress and human welfare, and promote science education in New Mexico.

The Academy has been in continuous existence since 1915, and became formally associated with the New Mexico Museum of Natural History and Science in 1995.

Affiliated with the American Association for the Advancement of Science (AAAS)

Member of the National Association of the Academies of Science (NAAS)

DID YOU KNOW?

Franklin founded the American Philosophical Society, created in 1743 to "promote useful knowledge in the colonies." Franklin proposed that the group be comprised of "ingenious men"— who lived throughout the colonies. The purpose of the group was to facilitate the sharing of information about discoveries being made in various fields.

A respected intellectual institution, the American Philosophical Society still exists two hundred and sixty years later.

President's Message - November 2006

Dave Thomas

Encourage a young scientist!

Science literacy is one of the most pressing concerns of today's society. Basic scientific knowledge is becoming increasingly important in local and national politics, strongly affecting how society tackles issues such as global warming, embryonic stem cell research, alternatives to fossil fuel, or evolution and diversification of species. Being a good citizen today involves knowing more about the science behind the issues than was required in the "Good Old Days." Nowadays, knowing about the science-related positions of candidates standing for public office is as important as knowing which side of the aisle they sit on. Science literacy is becoming increasingly essential, even for the most basic of public policy discussions.

Knowledge of science can also benefit each of us as we make personal choices every day. When making decisions on which foods are healthiest, or what routes are most efficient, or which purchases are most economical, or what gadgets are genuinely useful, or which politicians are most honest, the processes of science – gathering observations, formulating explanations, and *testing* those explanations – provide a recipe for making informed decisions on just about anything. Several of us enjoy doing science for a living, and science-based careers are often among the most rewarding, both financially and intellectually. But why, if doing science is at once useful and illuminating, is science illiteracy such a glaring problem in today's world? I learned about one case of science illiteracy the hard way last spring, when an Austin, Texas taxi driver could not deliver me to a given address, even with the help of an on-board global positioning system mapping utility. If even the most mundane of careers are now requiring more scientific literacy, why is science appreciation still so rare?

Some resistance to science is cultural – "smart" is often portrayed as the very antithesis of "cool," and ignorance of basic facts is sometimes promoted as "rebellion" against the mainstream or successful segments of society. These ingrained stereotypes can be very hard to fight against, but that is what we, as a society, must do.

If you see a young student falling into an anti-science/anti-knowledge mindset, you might try pointing out alternatives to that tired old "anti-knowledge" view. Does the student have a favorite grandparent? Might that grandparent fall victim someday to Alzheimer's disease, or Parkinson's? Wouldn't that grandparent be as thrilled as one could be if their own grandchild was the one that helped find a scientific remedy for their condition? Or helped develop space travel, or super-computers?

However, more than day-to-day utility, or even solving really big medical problems, science offers each of us the chance to be excited about understanding the curious universe we find ourselves in. Understanding the natural world can be a huge source of personal fulfillment. Instilling a sense of wonder at an early age may be the most important thing we can do for any child.

You don't have to be a rocket scientist, or have your own medical laboratory, to help promote wonder. This marvelous thought process can be promoted with simple nature hikes or scavenger hunts. I have a young grand-niece who is in the first grade this year. Three years ago, I took her on her first official Scientific Field Trip, in which she found oceanic fossils in the Jemez Mountains, thus showing New Mexico was once under an ocean. Two years ago, my grand-niece earned a "Junior Naturalist First Class" award by finding and photographing migrating birds at the Festival of the Cranes. And last year, she followed an elaborate set of clues on an Old Town Scavenger Hunt. Over the years, she has learned that science is fun, is something that girls can enjoy, and is rewarding in its own right.

Next year, Albuquerque will host the Intel International Science and Engineering Fair. I encourage you to support this huge science-promoting activity. Over one thousand local judges are needed (contact Len Duda if interested, <leduda@sandia.gov>). Besides being a Judge, you might consider mentoring local students doing projects, or speaking to local science classes on what Science Fair is all about.

But even if you don't participate in ISEF 2007, you can continue to promote science for the next generation. Take a child on a fossil hunt, or to a museum. Get out your old GPS handheld unit and organize a Scavenger Hunt. Explain to a youngster why they'll never, ever see a full moon on the horizon at midnight.

If you can get kids hooked on the Wonder, the rest will follow.

DID YOU KNOW...Ben Franklin....

Inventions:

Franklin was one of the most practical inventors in history. He built many devices that were designed to help improve or solve everyday problems. Some of his inventions, like bifocal glasses, are well-known, while others are more obscure. Of the numerous inventions Franklin created, he did not patent a single one. Franklin believed that "As we benefit from the inventions of others, we should be glad to share our own...freely and gladly."

Here are a few of the useful inventions that Franklin devised or improved upon: Swim fins; Flexible catheter; Library chair; Extension arm; Franklin stove; Street lighting; Odometer; Three-wheel clock; Bifocal glasses; and Daylight Savings Time

Lightning Rod:

Franklin came up with the idea for the lightning rod in 1750 and worked for three years to perfect the invention. Franklin believed that the lightning rod was his most important invention. Unfortunately, some New Englanders thought that the lightning rod and its originator were to blame for provoking divine wrath. It was a widespread belief in the 18th century that lightning was God's instrument in manifesting displeasure and lightning rods were believed to "meddle" with his reprimands. Franklin answered his critics by pointing out that if it was acceptable to build a roof to keep out the rain, why not place a rod upon it to keep out the lightning.

Common Cold:

In the 18th century, most people believed that wet clothing and dampness in the air caused the common cold. However, Franklin observed that sailors, who were constantly wearing wet clothing, remained healthy. After considering the matter on and off for several years, he eventually concluded: "People often catch cold from one another when shut up together in small close rooms, coaches, &c. and when sitting near and conversing so as to breathe in each other's transpiration." Before the knowledge of viruses and germs, Franklin had determined that the common cold was passed between people through the air.

Fire Company:

The fire and building codes we have today were unknown in eighteenth century America. Most houses were built of wood and heated by open hearths and fireplaces. The danger of fire was always present. Some cities, such as Boston, established loosely organized fire fighting companies to help prevent disaster. Franklin suggested that Philadelphia should have fire-fighting clubs modeled after the ones in Boston and he organized the Union Fire Company, which was incorporated in 1736. Members of the fire company pledged to help one another should fire break out and to help save goods and protect the building from looters. Members had to provide at least two buckets for carrying water and several cloth bags for carrying items rescued from the fire.

Gulf Stream:

During his many transatlantic voyages (the first was in 1724), Franklin measured the ocean temperature at various depths and surmised that the gulf stream was a warm river flowing thru the ocean. He produced a map of it and suggested that using it would increase the speed of ships crossing the Atlantic.

Insurance:

Franklin was an early proponent of mutual insurance. In 1751, Franklin and his Union Fire Company met with other Philadelphia fire-fighting companies to discuss the formation of a fire insurance company, the Philadelphia Contributionship, which was the first successful fire insurance company in the colonies. In May 1752, the board of directors, of which Franklin was a member, decided to form an insurance company. Members agreed to make equal payments to the contributionship, which would be used to pay for losses to any member due to fire. The first policies had a term of seven years; and after expiration, the premium money was returned to the policyholders. In the first year of operation, 143 policies were written.

Plate Tectonics:

Franklin suggested that the Earth's continents moved on top of a fluid interior layer – close to the real situation of plate tectonics. He proposed this idea in 1782.

Glass Armonica:

Perhaps the least well-known of Franklin's accomplishments are in the field of music. Not only did Franklin play viola da gamba and compose music, he also invented an instrument—the glass armonica.

In 1761, while living in England, Franklin heard a performer playing musical glasses. Franklin was charmed by the music, but felt that there was a better way to create the same sound. He had a glassmaker create thirty-seven hemispheres made of glass, with each hemisphere being a different size and thickness to produce different pitches. Franklin ran an iron rod through a hole in the top of each hemisphere so that they could nest together from largest to smallest. He linked all of this to an apparatus like a spinning wheel, with a foot treadle that turned the rod, making the glass hemispheres rotate. Franklin moistened his fingers and held them against the rims of the glass hemispheres as they turned. The glass hemispheres were color coded with paint to identify the notes.

The instrument became so popular that thousands were built and sold, and one factory employed over a hundred people to build the instruments. Many of the performers were women, which was somewhat unusual for the period. One of the musicians, Marianne Davies, performed all over Europe and even gave lessons to the French queen Marie Antoinette. Mozart wrote two pieces for the armonica, including "Adagio and Rondo 617," and in 1815, Beethoven wrote a short melodrama where a narrator told a story while accompanied by armonica.

Some of the people who performed regularly on the armonica complained that the instrument was upsetting them emotionally. They said that the vibrations were entering their fingertips and causing mental anguish. There has been some conjecture that these conditions were caused by lead poisoning from lead in the glass. Lead was a commonly used metal in the eighteenth century, so it is difficult to determine if these players' maladies came from the lead in the armonica or from other sources.

This information has been adapted from the Ben Franklin pages on the PBS.org web site. A Teacher's Guide with 8 lesson plans is also available. For more information about Benjamin Franklin, Log on to <http://www.pbs.org/benfranklin/teachersguide.html>

Attend the 2006 NMAAS Annual

Banquet - Awards - Lecture

Saturday, December 2, 2006

Begins at 6:00 P.M.

@ New Mexico Museum of Natural History

1801 Mountain Rd. NW, Albuquerque, NM

This event requires a reservation and a fee

See page 8 for cost and reservation form

Join us for the NMAAS annual meeting and banquet. Reservation form and information is on page 8 of this newsletter. Dinner will begin at 6:00 p.m., followed by awards to the NMAAS 2006 New Mexico Outstanding Science Teachers. Two teachers have been selected by the Awards Committee from teachers nominated by their principals, colleagues, or students from throughout New Mexico.

Our 2006 Distinguished Lecturer is Dr. Richard Sonnenfeld, NM Institute of Mining and Technology, and a research scientist at Langmuir Laboratory for Atmospheric Research in the Magdalena Mountains of New Mexico.

Dr. Sonnenfeld is an associate professor of physics at NM Tech. He earned a BSE in engineering physics at Princeton University in 1981 and a Ph.D. in experimental solid-state physics at the University of California, Santa Barbara. He worked previously at IBM's Almaden Research Center in San Jose, CA, and for Seagate Technology and Maxtor Corporation. The common theme of his work is the integration of modern electronic technologies in the service of scientific objectives.

Langmuir Laboratory is an eminent lightning and atmospheric research facility (see the accompanying story).

Don't delay, reserve your space now for the NMAAS annual banquet. Mail the form on page 8 or call or email the NMAAS treasurer (at marilynsavitt-kring@comcast.net) with your reservation.

DID YOU KNOW?

While Franklin was in France in 1783, representing the U.S. in the court of Louis XVI, he noticed a sulfurous haze that hung over the country during the summer and he noticed that the winter of 83-84 was exceptionally cold in North America and Europe. He correctly correlated anomalous temps with the haze and suggest that they might be related to a large eruption (the Laki Fissure Eruption) that took place in Iceland in 1783. His suggestion constitutes the first documented recognition that volcanic activity might affect weather.

FOCUS ON....New Mexico Science...

Langmuir Laboratory for Atmospheric Research

Langmuir Laboratory for Atmospheric Research, operated by New Mexico Institute of Mining and Technology, is a leading thunderstorm research facility in the U.S. and is recognized worldwide for the scientific work carried out there. The facility is named in honor of Nobel Laureate Dr. Irving Langmuir who initiated and conducted numerous experiments in cloud physics and weather modification in association with the Institute staff from 1947 until his death in 1957.

The Laboratory is used extensively by scientists at the Institute, as well as by visiting investigators from other parts of the U.S. and other countries. Their research includes studies of the initiation and growth of cumulus convection; the relations between lightning and rainfall; the formation of hail; the location and distribution of lightning and of charges in thunderclouds; the fine structure of lightning; the effects of point discharge on cloud electrification; and the electrical budgets of thunderstorms.

The facility includes cloud physics and doppler radars, tracking radars, a dense net of electric field meters, a balloon hangar for launching free and captive balloons, rocket launchers, a restricted airspace provided by the Federal Aviation Administration, video cameras reporting the cloud development over the mountain, a 200 horsepower Schewizer airplane that can be directed to fly through areas of charge within an electrified cloud, an electrically-isolated underground room at the summit of a mountain peak, and other research tools.

The Laboratory was established in the 1963 to provide a permanent base for the study of cloud processes that produce lightning, hail, and rain. These processes are not understood and are difficult to study because they operate in large clouds that cannot be simulated in a laboratory. The Magdalena Mountains were chosen for the location of the Laboratory because thunderstorms are initiated by the mountains and the storms are often isolated, stationary, and relatively small.

Scientists who were key in the creation and expansion of the lab were Dr. E.J. Workman, Dr. Marvin Wilkening, and Dr. S.A. Colgate (all members of the NM Academy of Science). Dr. Wilkening was a Past-President of the NMAAS, and in 1962, Dr. Workman was awarded the NMAAS Award for Outstanding Contributions to Science and Science Education in NM.

For more information about Langmuir Lab, log on to <http://www.ee.nmt.edu/~langmuir/>

(This article was adapted from information in the web site www.ee.nmt.edu/~langmuir/brochure.html which was in turn adapted from a brochure produced by NM Tech in 1977)

DID YOU KNOW?

Franklin experimented with giving electrical shocks to individuals who had paralysis in their limbs due to a stroke or other cause. He observed improvement in many, but observed that most relapsed after several days. Although he was initially excited about the possibilities, he wrote that the advantage gained from electricity was not permanent. Modern medical doctors today stimulate immobile muscles with electrical impulses to help prevent atrophy.

Franklin also made some of the earliest observations linking health problems with exposure to lead. He analyzed a list of those suffering and deduced that all of them were in professions where they were exposed to large quantities of lead.

Join the NMAAS Endowment Campaign and Support Science and Science Education in New Mexico

The NMAAS has instituted an endowment for the long-term support of the many science education programs of the Academy. If you have wanted to provide enduring aid to the important work of the Academy in supporting science and science education throughout New Mexico, this is the perfect opportunity for your "end-of-year" tax deductible contributions.

The NMAAS is a 501(c)(3) non-profit and all donations to the endowment are tax deductible. We ask all NMAAS members to remember the NMAAS Endowment Fund when planning their charitable giving. We especially encourage our Life Members to contribute now as Founding Contributors to the NMAAS Endowment in order to help build the endowment rapidly, and to remember the NMAAS in your long-range financial planning. THANK YOU.

Founding Contributors to the New Mexico Academy of Science Endowment as of November 2006

<i>Marshall Berman</i>	<i>Maureen Romine</i>	<i>Dave Thomas</i>
<i>Mona Pomeroy</i>	<i>Harry Pomeroy</i>	<i>Marvin Moss</i>
<i>Jayne Aubele</i>	<i>Larry Crumpler</i>	<i>Glenn Kuswa</i>
<i>Robert Amai</i>	<i>Stirling Colgate</i>	<i>Arthur Guenther</i>
<i>Debra Thrall</i>	<i>Barry Clark</i>	<i>David Hsi</i>
<i>Malva Knoll</i>	<i>David Steinhaus</i>	<i>William Chambers</i>
<i>Aija and Philip Thacher</i>		

Please add your name here - send a contribution to the NMAAS Endowment - see page 7

AND...another way to help NMAAS...

If you work at Sandia National Laboratory and wish to donate to the NMAAS, you can also select NMAAS through the **United Way Campaign**.

"In this world nothing is certain but death and taxes"

Benjamin Franklin

Announcing the Publication of the NM Journal of Science, Volume 44, August 2006

Science on the Border

Kurt S.J. Anderson, Editor

If you are a member in good standing of the NMAAS (dues paid for 2006) you should have received a copy of the journal in the mail. The Academy is very proud to have partnered with the Southwest Consortium for Environmental Research and Policy to produce this excellent compendium showcasing the variety of research accomplished by scientists on both sides of the border, on topics that relate to the residents of both countries. Contact the NMAAS if you have not yet received your copy of the journal or if you would like to purchase additional copies. For more information about SCERP, please log on to www.scerp.org/

Membership Form New Mexico Academy of Science

New Membership[] Renewal[] For Membership Year other than 06[] Publications[] Donation[]

Date _____ Name _____

Employer/Firm/Affiliation _____ Title _____

Primary Interest (geology, biology, chemistry, physics, science education, etc.)_____

Mailing Address: _____

Phone _____ FAX _____ email _____

Check if your address is different from that on the mailing label of this newsletter []

NMAS PUBLICATIONS

New Mexico Journal of Science <small>Set of all available pre-1992 back issues</small>	\$10 _____
From Sundaggers to Space Exploration <small>(NMAS/Sigma Xi, 1986)</small>	\$4 _____
Dinosaurs of New Mexico <small>(NMAS Journal v. 32, 1992)</small>	\$10 _____
The Importance of Agricultural Science in New Mexico's Economy <small>(NMAS Journal v. 34, 1994)</small>	\$10 _____
Astronomy in New Mexico: Past, Present and Future <small>(NMAS Journal v. 35, 1995)</small>	\$10 _____
New Mexico's Natural Heritage: Biological Diversity in the Land of Enchantment <small>(NMAS Journal v. 36, 1996)</small>	\$10 _____
Environmental Management: Current and Future Needs <small>(NMAS Journal v. 37, 1997)</small>	\$10 _____
Water Resource Issues in New Mexico <small>(NMAS Journal v. 38, 1998)</small>	\$10 _____
Ensuring Sustainable Development of Arid Lands Through Time <small>(NMAS Journal v. 39, 1999)</small>	\$10 _____
NMAS Journal v. 40, 2000	\$10 _____
NMAS Journal v. 41, 2001	\$10 _____
NMAS Journal v. 42, 2002 (Centennial CD)	\$10 _____
NMAS Journal v. 43, 2003	\$10 _____
NMAS Journal v. 44, 2006	\$10 _____
Subtotal:	\$ _____
+ Handling:	\$ 2.00
TOTAL:	\$ _____

Membership Class (check one)

[] Member \$20/year

[] Student \$15/year

[] Subscription \$30/year
(Libraries only)

[] Contribution to the \$_____
NMAS Endowment

Membership Subtotal: \$_____

Donation Subtotal: \$_____

Publication subtotal: \$_____

Total: \$_____

Membership includes 3 newsletters. and occasional special Journal of Science volumes (sent to life members and members who have paid their annual dues during the volume's year of publication).

Send check for membership and/or publications and donations, payable to NMAS, to:

**New Mexico Academy of Science
1801 Mountain Rd. NW
Albuquerque, NM 87104**

Please...consider making a donation to the NMAS Endowment to support our science education programs!

NMAS Newsletter
Volume 92 no. 3
November, 2006

**NMAS 2006 Annual Banquet, Awards, and Lecture
December 2 2006**

Registration for NMAS banquet/lecture evening event:

\$30.00 (includes banquet and lecture)

Lecture only registration: \$15.00

NOTE: this registration is for the evening event only...for the glass armonica event, please see the registration information on page 1 of this newsletter.

Name: _____

Mailing Address: _____

Email address or phone number: _____

Registration for banquet/lecture for _____ persons = \$ _____ (@\$30.00 each)

Registration for lecture only for _____ persons = \$ _____ (@\$15.00 each)

Total Amount Enclosed = \$ _____

Please mail (or email or phone) your registration (for the banquet/lecture event) to:

New Mexico Academy of Science

2732 Tramway Circle NE

Albuquerque, NM 87122

ATTN: Marilyn Savitt-Kring, Treasurer

To register for the banquet/lecture evening event by email or phone (and pay with a check made out to NMAS when you arrive) contact marilynsavitt-kring@comcast.net or 505-856-6654 for more information or to make reservations.

Don't Delay....Registration must be received by November 29th.



**NEW MEXICO
ACADEMY
OF SCIENCE**

Newsletter

1801 Mountain Rd NW
Albuquerque, NM 87104